

Marine Natural Capital at Risk – Retained EU Law (Revocation and Reform) Bill

Report by: [Marine Conservation Society](#)

First published: [January 2023](#)



Marine Natural Capital at Risk – REUL

The following report highlights important areas of economic value provided by UK marine natural capital that could be put at risk if key, long-standing environmental protections are removed or weakened by the end of this year.

The Retained EU Law (Revocation and Reform) Bill could see swathes of environmental and marine conservation laws scrapped or weakened by the end of 2023 because they are 'retained EU law' (fundamentally that means domestic law that was originally based on EU legislation).

This includes key laws affecting the marine environment regarding habitats and species protections, fisheries management, marine and freshwater water quality, marine impact assessments, chemicals and others, for example the Marine Strategy Regulations 2010, the Conservation of Habitats and Species Regulations 2017 and the REACH regulations. If these are removed or weakened, this is expected to have severe consequences for the UK's marine environment, including but not limited to:

- Further deterioration of water quality
- Destruction of key habitats and loss of species
- Loss of biodiversity
- Loss of coastal protection

This damage to the marine environment threatens to diminish economic value provided by the natural capital within it ([natural capital](#) refers to natural assets that provide benefits and economic value to society).

Based on available data, the [Office for National Statistics](#) values the UK's marine natural capital assets at £211bn. The following figure is taken from the latest [marine natural capital accounts](#), showing total asset values for UK marine natural capital. These do not capture all of the valuable services that the marine environment provides such as coastal protection, which is worth between [£3.1 and £33.2 billion per year](#) to the UK economy.

Asset value of marine services, £ million, 2019 prices, UK, 2018

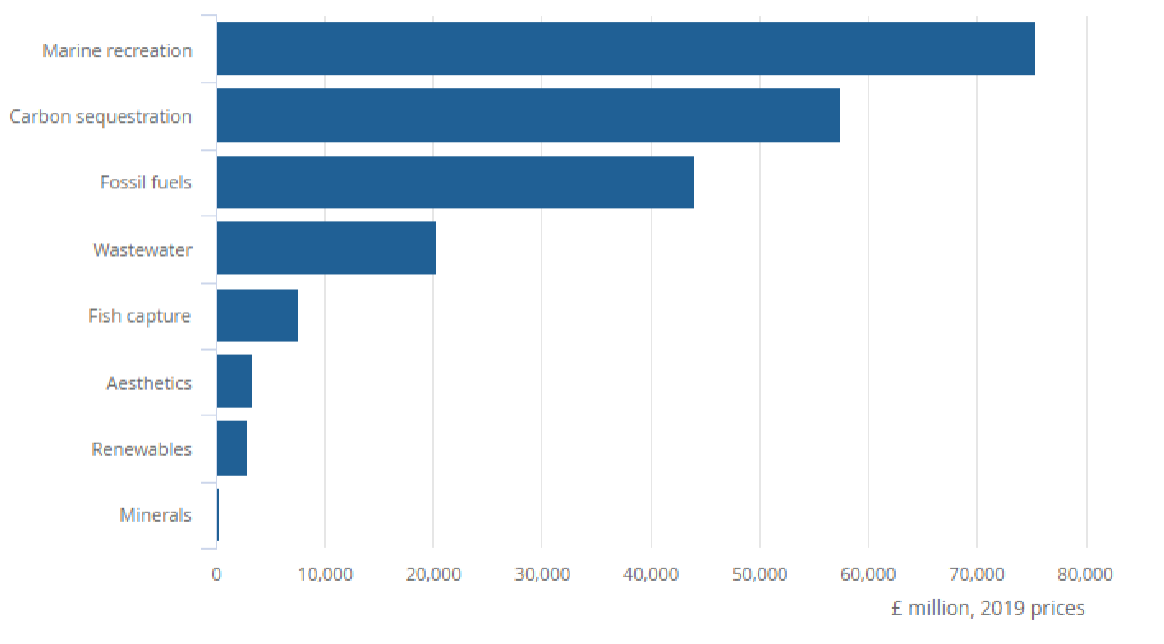


Figure 1: Asset value of marine services in 2018, taken from the ONS marine natural capital accounts. Notably, both marine recreation and carbon sequestration are valued above fossil fuels.

These valuations consider carbon sequestration, fishing, tourism and recreation as well as energy production. In reality, the true value that is being put at risk by removing environmental protections will be significantly higher for reasons outlined further below.

UK coastal habitats provide an estimated [£48 billion of economic benefits to society](#), despite occupying only 0.6% of the total land area. Key habitats such as seagrass and saltmarsh are listed as vulnerable habitats protected by the Habitats Regulations through the designation of Special Areas of Conservation (SACs). Loss of this protection will put the economic and societal benefits these habitats provide at risk (including natural coastal protection, recreation and tourism assets and carbon storage).

The marine environment already suffers from a lack of overall protection across the UK's waters and minimal protection within much of the Marine Protected Areas network. In a business as usual scenario, WWF's [Global Futures report](#) predicts that the depletion of marine natural could cost the UK economy £16 billion each year by 2050 in lost coastal protection (£15 billion) and fisheries value (£1 billion) alone. These losses can be expected to be greater, and peak sooner, if existing protections are removed.

The benefits to society of conserving marine ecosystems outweigh the costs. A report by [Natural Resources Wales](#) examining the socioeconomic benefits of marine protection areas states that the non-market benefits of marine conservation are worth £16.6 billion to the UK public over a 20-year time span¹.

Underestimating the value of the marine environment

The implications of removing protection or causing flawed and incomplete frameworks of legal safeguards via deregulation, are likely to be severely underestimated.

As highlighted by the [Office for National Statistics](#) in their marine natural capital accounts, economic valuations of marine natural capital can be significantly underestimated. This can have several reasons, including:

- *Incomplete data.* We do not have complete records for the [full extent of coastal habitats](#), particularly seagrass which performs a number of valuable services including carbon sequestration, coastal defence and provision of nursery habitats for commercially valuable fish. Where data is available, quantifying and valuing ecosystem services remains very difficult, particularly for lesser studied habitats such as kelp forests and mudflats.
- *Cascading effects.* The marine ecosystem is a highly complex network of species, habitats, geochemical conditions and more. Analysing any of these in isolation is likely to underestimate their true value as it does not capture the [cascading effects](#) of their survival or demise. For example, the demise of a seagrass meadow will have knock-on effects that are very difficult to quantify, including impacts on fishing stocks, acidification of the ocean and reduced nutrient regulation. Deteriorating water quality can have wide reaching impacts that could prove immeasurable.
- *Intangible values.* The marine environment is part of Earth's life support system, without which society cannot survive. In this case there is a strong argument that it has infinite value, as noted by [Costanza et al. \(1997\)](#) whose ubiquitously cited paper brought natural capital into the mainstream.

¹ [Non-market valuation](#) considers the value of environmental goods or services that do not have a market price, such as clean water. [Alternate methodologies](#) are used to estimate a monetary value based on the trade-off a person would be willing to make for the provision of a good or service.

Marine Protected Areas

Marine Protected Areas (MPAs) have been calculated to be worth billions of pounds without even accounting for their key role in climate mitigation. Most marine protected areas, especially offshore, are designated under and managed according to retained EU law such as the Conservation of Habitats and Species Regulations 2017, the Conservation of Offshore Marine Habitats and Species Regulations 2017 and Marine Works (Environmental Impact Assessment) (Amendment) Regulations 2017. Removing or weakening those laws will leave MPAs undefended and unmanaged, creating huge financial costs and losses.

Marine Protected Areas (MPAs) are commonly designated to [protect areas of biodiversity](#). In the [Future of the Sea: Marine Biodiversity](#) report, the Government Office for Science states that UK marine biodiversity can be worth up to £2,670 billion. This figure, taken from [Beaumont et al. \(2008\)](#), was based on ecosystem service valuations taken from 2002–2004 and a modern assessment with more data would probably increase this value.

In Scotland, [a report to Scottish Environment Link in 2012](#) estimated the benefits from a proposed network of MPAs in Scotland to be between £6.3 billion to £10 billion over a period of 20 years in use and non-use benefits. Again, the report states that these are likely to be underestimates due to incomplete data and the difficulty in measuring the value, for example, of services like pollutant removal. These values could be higher depending on the level of protection and enforcement achieved by an MPA.

The benefits of MPAs vary from site to site, but for tourism and recreation services alone the benefits can equate to [£10 million per MPA](#). A UK National Ecosystem Assessment report by [Kenter et al. \(2013\)](#) considered economic value of recreational ecosystem services in UK MPAs. The annual recreational values calculated at the time were £1.87 – £3.39 billion for England, £68 – £112 million for Wales and £67 – £117 million in annual benefits for Scotland.

According to [Hughes et al. \(2022\)](#), properly enforced MPAs can play a valuable role in nitrogen regulation to control the impacts of human-caused nutrient enrichment (e.g. agricultural runoff and sewage discharges into river catchments, estuaries and coastal waters) within marine ecosystems. Continental shelf sediments are estimated to have a denitrification rate of 800 kg of N per km² per year which would increase to 880–4000 kg N km⁻² yr⁻¹ if sediments were properly protected from damaging activities such as bottom-trawling. The monetary value across 80 – 120 years of nitrogen removal is estimated at £2.2 – 12 million per km² based on the price of terrestrial nitrogen credits.

In addition to their role in marine conservation, MPAs play a key [role in mitigating climate change](#) by safeguarding marine habitats and ecosystems that sequester and store carbon. This carries a great economic value that is outlined in more detail below.

Carbon sequestration

Removal of retained EU laws not only impacts the highly valuable capacity for UK seas to store carbon through degraded habitats but could potentially lead to huge volumes of carbon being released from disturbed sediments.

Blue carbon habitats are reliant on the same legislation that support MPAs and further EU-derived laws supporting ocean health such as the [Marine Strategy Regulations 2010](#).

The ocean is a vital carbon sink that absorbed approximately [22% of man-made carbon emissions between 2010 and 2019](#). Vegetated coastal habitats (primarily saltmarshes, seagrass beds and mangrove forests) account for [almost half](#) of all the carbon buried in ocean sediments and [80% of total global carbon](#). Marine ecosystems will play a key role if the UK is to meet its ambitions for net-zero by 2050, particularly as the UK has one of the world's [largest Exclusive Economic Zones](#) and governs substantially more [marine territory than terrestrial](#).

Conservative estimates by the Office for National Statistics indicate that seagrass, saltmarsh, sands and muds together could sequester 10.5 million tonnes of CO₂e per year. This has an estimated value of [£57.5 billion](#). However, the seabed could store over [60 million tonnes of CO₂e](#) per year which would raise this value beyond £328 billion².

There is also a huge amount of carbon already stored in UK shelf seas and sediments. The UK's shelf seas extend to over [500,000 km² and store an estimated 205 million tonnes of carbon](#); more than the UK's entire carbon stock held in forests. When including carbon stored beneath saltmarsh and seagrass, this value rises to 220 million tonnes. By failing to adequately protect these carbon sinks, carbon that is stored in sediments for periods [of centuries to millennia](#) can be released by loss of habitats and destruction to the seabed.

² This is an estimate extrapolated from the previous valuation at 10.5 million tonnes.

A [2019 report](#) by the Natural Capital Committee on marine natural capital in the context of the 25 year Environment Plan references predictions that the contribution of coastal habitats (saltmarsh and sand dunes) to carbon sequestration could fall by 75% in value due to continued habitat loss. These estimates are drawn from [Beaumont et al. \(2014\)](#) who estimated that saltmarsh, sand dunes and machair will provide an ecosystem service worth £1bn in sequestered carbon between 2000 and 2060. Beaumont et al. (2014) state that if loss-trends worsen, which would be expected when removing regulatory protections, the loss in value will be even greater than this. However, this is likely still a vast underestimation because the analysis excludes numerous key blue carbon habitats, including seagrass, kelp, and marine sediments (which are the [largest stores of carbon](#) in the marine environment).

Given the relatively large extent of shelf seas compared to other nations, cutting emissions through reduced sediment disturbance (particularly of muddy sediments) should be in line with the [UK Government's commitments](#) to the Paris Climate Agreement and to cutting emissions by 2030.

Coastal defence

Coastal habitats such as saltmarsh and seagrass provide billions of pounds of savings to the UK economy through provision of natural coastal defence against flooding and coastal erosion that could be lost by removal of protection.

These key habitats are protected by EU-derived legislation, notably through the Conservation of Habitats and Species Regulations 2017 and are reliant on a healthy marine environment.

Coastal habitats provide a natural form of defence against flooding and coastal erosion. For example, the first 10 – 20 metres of saltmarsh, which makes up the majority of natural flood defence in the UK, can attenuate wave energy by [up to 50%](#). In doing so, the presence of salt marshes can reduce costs of sea walls by [£2600 - £4600 per metre](#) of sea wall. The government is already spending [several billion](#) on coastal defences to avoid much greater costs in the future. However, with removal of protections for these habitats, the reality is likely to be one of greater cost rather than savings. Loss of natural forms of defence will undermine existing coastal defences and place communities at risk from flooding and coastal erosion.

Today, flooding costs the UK approximately [£2.2 billion per year](#) and can be expected to increase with sea-level rises and more frequent storm events. Compared to the costs of man-made alternatives, natural coastal defence provided by intertidal coastal habitats is valued between [£3.1 and £33.2 billion per](#)

[year](#) in gross value added. The [UK National Ecosystem Assessment Follow-on report](#) estimated that coastal defence services provided by salt marshes in England alone were worth up to £9.7 billion in savings on equivalent man-made protection. The presence of other habitats such as seagrass and kelp forests – for which there is a paucity of data available – would raise this value further. By 2050 the provision of coastal defence services by restored and protected coastal habitats could save the UK Government an estimated [£6.2 billion](#) in spending on man-made flood defences.

The value of coastal defence also grows when we consider what is at risk of flooding in coastal areas. According to the [Climate Change Committee](#), the value of assets at risk from coastal flooding lies between £120 and £150 billion, accounting for businesses, properties and vital infrastructure including nuclear power stations of which 12 are at risk of coastal erosion. By 2080, the Environment Agency estimates that £120 billion of coastal infrastructure will be at risk of coastal flooding due to sea level rise.

The benefits of restoring saltmarsh outweigh the costs through flooding protection, without considering other benefits including carbon sequestration. To illustrate, saltmarsh in the Severn Estuary supports the protection of 100,000 homes and businesses with a value of [£5 billion](#). By contrast, establishing and monitoring these coastal habitats is estimated to cost [£9 million over three years](#) – only a fraction of spending on artificial coastal defences.

Conservation is much more cost-effective and successful than restoration and the UK already has an existing coverage of saltmarsh and seagrass in its coastal waters. This value is presently being eroded due to habitat loss and will be subject to increased threats without environmental protection of EU-derived legislation.

Fisheries and aquaculture

Mismanagement of our marine environment undermines the economic stability of the fisheries and aquaculture sectors and the jobs that they support. These sectors will already be under pressure due to climate change but will further be impacted by the removal of EU-derived regulations.

Examples of these include Regulation (EU) 2019/1241 on the conservation of fishery resources and the protection of marine ecosystems through technical measures and the Commission Regulation (EC) No 2056/2001 for the recovery of the stocks of cod in the North Sea.

In 2018, the UK aquaculture industry had a total income of [£972 million](#). According to [OECD figures](#), the 0.9 million tonnes of fish produced that year had a value of £2 billion (half from aquaculture and half from fisheries). Across fisheries and aquaculture there are approximately [11,000 full time employees](#). In 2021, UK vessels landed 652,000 tonnes (live weight) of sea fish worth [£921 million](#).

The fishing industry is already under pressure and fish stocks are falling. Without ocean recovery, the sector is expected to face costs of [£1.5 billion](#) due to climate change if action is not in place to allow natural recovery of fishing stocks to maximum sustainable yields. The impacts of ocean acidification and warming are expected to cause a decrease in standing stock resulting in up to [21% decreases in revenue](#) between 2020 and 2050, along with a similar percentage reduction in employment. However, WWF predict that restoring fishing stocks of cod and haddock to sustainable levels could increase economic benefits by £4.2 million by 2030 and £11.9 million by 2050. Restoration of all species to maximum sustainable yields would deliver an expected additional 442,000 tonnes of fish per year, providing 6,600 additional jobs instead of a reduction in employment and an expected [equivalent to £440 million](#) of additional earnings for the sector. As an additional benefit, carbon sequestration value could rise by [£61.7 million by 2050](#) by managing overfishing of species and allowing populations to recover.

A decline in our ocean health also presents a food security risk. Analysis by the [New Economics Foundation](#) indicates that the UK is not able to support its own demand with domestic production and has to import almost one third of the fish we consume. In 2018, imports of cod from Norwegian, Icelandic and Russian waters was worth [£500 million](#). This reliance and expense may increase if we do not safeguard our seas and the species within them.

Marine tourism and recreation

Poor water quality, damage to the amenity value of open spaces and loss of valuable species such as whales and dolphins will impact on tourism and recreation industries that contribute significantly to the UK economy and particularly to local coastal communities.

Legislation supporting healthy coastal marine environments, such as the, [Urban Waste Water Treatment Regulations 1994 and Bathing Water Regulations 2013](#), are key to sustaining these sectors.

The UK has a significant coastal economy and annual visits to the UK coast have a value of approximately [£17 billion](#).

Poor water quality, pollution and loss of habitats and species could impact the marine leisure and recreation industries which supported [86,400](#) full time equivalent jobs in 2015 and is valued at [£3.9 billion](#). Other estimates consider the marine tourism industry to be worth between [£4 billion and £5 billion](#) with [potential for further growth](#) depending on the state of our coastal waters. Much of this value is channelled into local coastal communities. For example, protection of Lyme Bay on the south coast boosted the economic impact of recreational activities which bring in over [£18 million to the local economy](#). The designation of an MPA in the area was itself estimated to add [£2.2 million](#) to this value.

The protection afforded by MPAs to marine species such as cetaceans (whales and dolphins) is estimated to achieve [continuity of £1.77 million in yearly revenue](#) for the Scottish tourism industry. The waters on the west coast of Scotland are believed to have the [greatest abundance and diversity](#) of whales and dolphins, valued at [£6.5 million](#) to the local economy. This is particularly important to coastal areas such as the [Moray of Firth](#) where a population of bottlenose dolphins have previously been credited for bringing in [£4 million to the local economy](#) each year.

Nutrient cycling

Mismanagement of nutrients and waste, and reduction of nutrient cycling services, can increase risks to marine ecosystems and human health as well as impacting the carbon storage potential of coastal ecosystems.

The [Water Environment \(Water Framework Directive\) \(England and Wales\) Regulations 2017](#) and [Urban Waste Water Treatment Regulations 1994](#) are examples of relevant regulations, and the protection these provide, at risk of being scrapped by the REUL bill.

Nutrient cycling, supported by biodiversity, in UK waters was valued by [Beaumont et al. \(2008\)](#) at £2.3 billion, accounting for its importance in supporting the marine food web and increasing marine productivity.

While nutrient cycling and waste remediation services are economically significant, nutrient loading and pollution are undermining the value of our marine natural capital assets. Loss of habitats and species through [eutrophication](#) and poor water quality will decrease the value of key services listed above and can also pose a growing [threat to human health](#). Poor water quality is also a [leading cause of restoration failure](#) for coastal habitats.

Recent research has shown that, aside from direct threats of eutrophication to coastal habitats, nutrient run-off can also [undermine the ability of blue carbon habitats to sequester carbon](#). In some cases, can even turn blue carbon habitats into net sources of greenhouse gas emissions. [Malerba et al. \(2022\)](#) explain that excess nutrient inputs increase the production and decomposition of organic matter in wetlands, raising dissolved oxygen content which increases production of methane which can offset or even outweigh sequestration of carbon. The impact of excess nutrients therefore poses a direct threat to habitats through eutrophication but can also significantly erode and reverse carbon sequestration value in coastal wetlands.

Concluding remarks - Missed opportunities

In 2019, a [report](#) from the Government Chief Scientific Advisor calls on the Government to seize opportunities to show global leadership by putting the sea at the heart of its agenda. Contrary to this, the reckless scrapping or weakening of fundamental protective legislation would create significant damage to the marine environment and diminish the economic value of natural capital outlined in this report. Furthermore, it could result in missed opportunities to significantly increase the economic value of our marine environment and underline a failure by the UK Government to meet the international obligations of the Convention on Biological Diversity.

As presented in the [WWF report on the value of restored UK seas](#), building on existing protective legislation, ocean recovery could generate additional economic benefits worth £50 billion and create up to 100,000 jobs by 2050. The report outlines key areas to achieve economic gains:

- Halting and reversing degradation of coastal habitats could yield carbon sequestration value of £10.1 billion by 2050. This would require tripling areas of seagrass and other habitats by at least 15% which would capture an estimated 137 MtCO₂e – equal to [33%](#) of the UK's greenhouse gas emissions in 2018. These estimates consider vegetated habitats and would be far higher if accounting for carbon stored and sequestered in the seabed – particularly if adequately protected from disturbances by bottom-contact fishing and offshore developments.
- Effective protection of 30% of UK seas could boost ecosystem service value by £10.5 billion and increase marine recreation and tourism employment by 12,000 jobs by 2050. The costs of managing an MPA over this time are estimated at £1.4 billion, again demonstrating that the costs of maintaining and implementing protection are eclipsed by the economic benefits it yields.

Despite the sizeable economic benefits of coastal restoration, it should be stressed that natural protection is both cheaper and more effective than restoration. Research has shown that once degraded and destroyed, habitat recovery becomes increasingly harder to achieve, particularly in the presence of [poor water quality](#).

Removing regulatory protection without thoroughly prepared and robust replacements, and without due parliamentary scrutiny and public consultation, will diminish the existing value of marine natural capital and compromise the potential to significantly increase the benefits society and the economy derive from the marine environment.

The government has not yet provided a detailed schedule for implementing the withdrawal of EU-derived legislation. It is therefore likely that the full implications of the REUL bill for the socio-economic impacts on the marine environment are yet to be fully determined and this calls into question the government's risk assessment procedures for this bill.



Please contact James Merchant
(james.merchant@mcsuk.org)
with any enquiries



Registered charity in England and Wales 1004005 and in Scotland SC037480.
Registered company limited by guarantee in England and Wales 02550966.
Registered office: Overross House, Ross Park, Ross-on-Wye, HR9 7US. VAT number: 321491232.



mcsuk.org  [mcsuk](https://www.facebook.com/mcsuk)  [mcsuk](https://twitter.com/mcsuk)  [mcs_uk](https://www.instagram.com/mcs_uk)